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ears each. These bunches are then hung from the roof to prevent attacks by rodents. Wherever possible the corn is hung where the heat from the fire will keep it from molding.

The foregoing are the chief agricultural food products of the Cayapa. Excepting the maize and the potato, all were introduced since the Spanish conquest and are now systematically cultivated. In this connection should be mentioned certain palms which provide food of one kind or other, and which, while they cannot be strictly classed under the head of agriculture, since they are not planted and tended as are the other plants mentioned, are of considerable economic importance.

One of these palms is that commonly known by the Spanish name chonta dura and called kanō'tci by the Cayapa. One variety of this produces a cluster of red fruits, another a cluster of yellow fruits. The Cayapa name for the fruit of this palm is ka'imbé. Both ripen in the late summer months and are much esteemed as food. By means of a long hooked bamboo pole, these clusters are torn from just below the crown of the palm, which is usually quite tall. The fruits are boiled in a cooking-pot or kettle; the tough skin is then easily peeled off, leaving the yellowish mealy meat ready to eat. In the center of this, in turn, is a very hard nut which, when cracked, yields a toothsome white meat with a flavor resembling that of ripe coconut. The mealy yellow meat is usually eaten with a little salt, but is especially good when eaten with a thick syrup made from cane juice. It is also frequently boiled in this syrup, the result being a kind of conserved fruit.

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similar to that used in making the bark cloth of the region. When the fibers are beaten out and prepared for twisting into cordage, they are usually stored away in bundles, such as that shown in pl. CXIX, 2, until needed.

An important economic plant of the Cayapa country is that from which is made the bark cloth called by the local Spanish name damajaua and by the Cayapa name tû'ckī. This is beaten from the bark of an indigenous tree called tû'ckītcī. The tree is felled and a section of the bark the length desired, usually six to eight feet, is carefully removed, being split along one side only. The bark may then be beaten immediately upon the same log, but it is ordinarily rolled up and taken to the house where a log is kept especially for this beating, which is done with a short maul, called tatcī wima'so, such as that shown in fig. 6. One side of the maul, at least, is cut diagonally with grooves and corresponding ridges. The beating must be done within a few hours after the bark is taken from the tree, or before it dries considerably. Placing the strip of bark crosswise upon the log, it is beaten with considerable force with the grooved side of the maul, which is held at an angle of about forty-five degrees to the length of the bark. After beating one short section of the bark in this manner, it is moved across the log far enough to bring a new section into place, and in this way every part of the bark is reached.

FIG. 6—Beater for bark cloth

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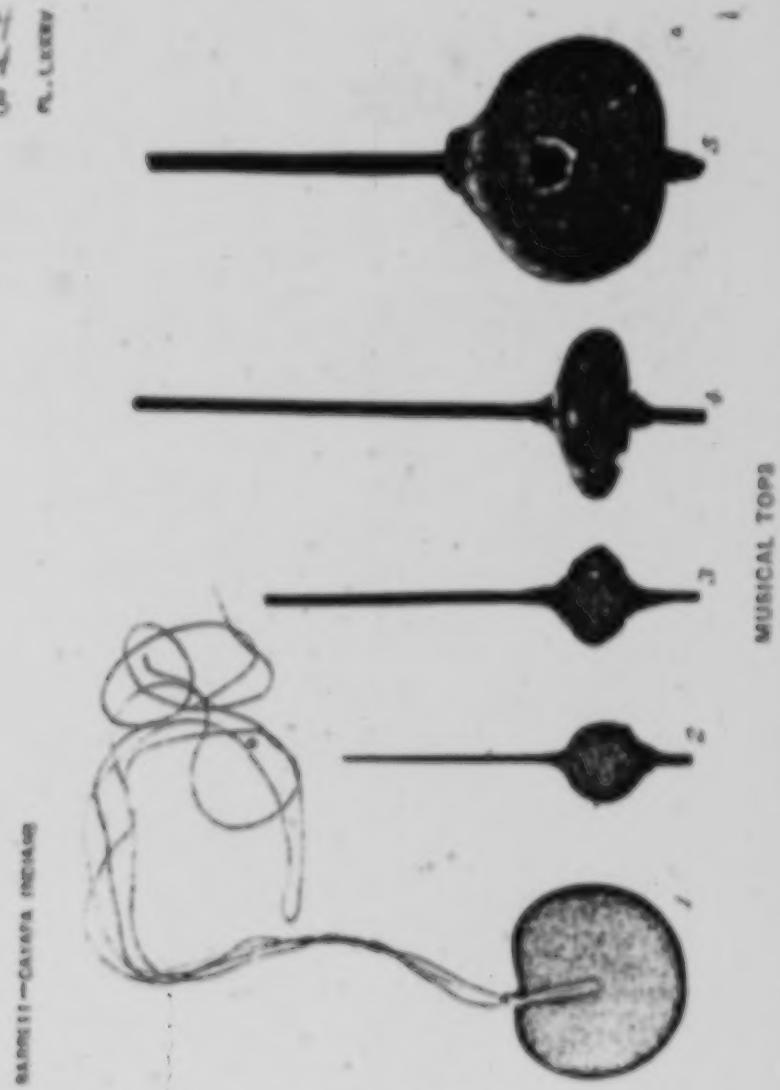

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with considerable care, especially from the globose water-calabashes (the wa'iyû) which have such small openings. By repeatedly striking the shell of the calabash gently with the point of a machete or other sharp-pointed implement in such manner as to chip the shell away little by little, an opening of the desired diameter is made: this is usually at or near the point at which the stem of the fruit was attached, and its size depends on the size of the calabash, but it rarely exceeds an inch and a half. With a long implement (wai-be'rû, or wai-be'û; from wa iyû, calabash, and be'rû, hook), such as that shown in pl. CXVII, 1, the seeds and pulp are removed. It has one end shaped like a chisel, the other being fitted with a piece of coconut-shell in the shape of a hoe-blade. The chisel end is first inserted and the mass of pulp cut and worked into as small pieces as possible, a small quantity of water being added from time to time. The greater part of the pulp having been thus removed, the implement is reversed and the inner walls of the calabash are scraped with the hoe-end until they are smooth and clean. This process is usually performed in a canoe at the river where an abundance of water is available. Finally the calabash is turned with the opening downward over a stick, outdoors, until it has thoroughly dried. This curing in the more or less direct sunlight changes the color of the outer surface of the calabash from light-green to dark-brown.

Calabash receptacles are frequently ornamented with incised lines or figures, or with grotesque figures of mammals, birds, and human beings. A variety of these

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tempering material is called tū ya'nda. The mixing of a small quantity of clay is a mere matter of rolling and kneading it in the hands; but if a considerable quantity is required, as in making a large olla, it is usually mixed in a large wooden tray such as that shown in pl. LXXII, 4. After thorough kneading, handfuls are torn from the side of the mass and thrown back violently on top of it. This process completed, a small lump of the clay is taken, or a very small, crude pot is made, and immediately baked in the fire-box in the house as a test. 323

To make a small plate-form utensil, one about four inches in diameter, a lump of prepared clay is rolled carefully between the hands to form a smooth sphere. The right thumb is then inserted and the ball of clay is turned about it in such manner as to make a depression in the center. Then by constantly pressing between the thumb and the fingers as the ball is rotated, the depression is gradually enlarged until finally the bottom and sides of the pot, of even thickness, are formed. If the vessel is very small, this work may all be done upon the palm of the left hand, but if it is of medium or large size, a board, ten or twelve by fifteen or eighteen inches (pl. LXXXVIII), or other flat object is used in order that the vessel may readily be turned. Occasionally the wooden base is elaborately made, as that shown in pl. LXXXIII, 1, which is circular, has four legs, and resembles in some respects the wooden benches before described. Its special use, however, is that of a rest for the larger pieces of pottery, and it is claimed by the Cayapa that it was rarely or never used as a seat. [413] 352

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323 The bottom and sides of the small receptacle having been formed, the edge is trimmed and made of uniform thickness by placing the thumb on the inner surface at the edge, the end of the first finger on the edge itself, and the ball of the second finger on its outer surface. By passing the fingers, held in this position, back and forth over a space two or three inches at a time, the edge is gradually reduced to uniform thickness and all unevenness is removed. Places thinner than desired are patched with a small quantity of clay carefully worked in and smoothed like the rest. Should there be a place that is too thick, a pinch of the clay is taken with thumb and finger before the smoothing is commenced. The edge is finally smoothly finished with the inner surface of a small piece of green banana or plantain peel.

[323] There is always a certain roughness on the inner and outer body surfaces of a pot at this stage; this is removed by means of small instruments, called tõmbilya'mba, made usually from sections of broken calabash dishes or spoons, the edges of which are ground on a stone until they are uniform in outline and sharp. The smoothing of both the surfaces and the edge having been completed, the pot is set in the shade to dry and harden. This requires, in the case of a small, thin-walled pot, only a few days, when it is ready for firing. Care is taken not to dry a pot too rapidly, and that it dries uniformly, on account of the danger of cracking due to differential shrinking.

The base of a larger pot is made from a lump or mass of clay in the same manner as that above described, except that the edge is not smoothed so carefully. This

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323 After a pot has become fairly dry and hard, its surface receives the final smoothing, and in some cases it is given [824 almost a polish. This is done by means of a large 413] discoidal nut, called mûlûmbû mûñge'nû, indigenous to the region. The same nut is used in making tops and also the spinning handles for tops. In pl. LXXXV, 1, 4, it is shown used in these two ways. In smoothing pottery the edge of the nut is wet with saliva and is rubbed back and forth repeatedly over the vessel, thus smoothing the surface and making it more impervious by filling the pores. No slip or paint of any kind is used.

The vessels are now ready for firing. A quantity of wood is gathered and the pots are carried to an open place near the house. Here they are stacked one within another or arranged on the ground in any convenient manner, and a kiln is made by carefully piling wood around and among them. Coals are brought from the fire-box in the house, the pile is ignited, and the fire is carefully watched and more wood added as required. A pottery kiln is shown in pl. LXXXIX, the photograph for which was taken just after the fire was lighted. This firing process requires from twenty minutes to an hour, depending on the number and size of the pots, and the quantity of wood used. As the fire dies down, the pots are left as shown in pl. XC, being now thoroughly fired. The earthenware is generally removed with a pole while still hot, and is tested by tapping gently to detect any possible cracking. If badly cracked the vessels are [356] immediately thrown away, but in the case of large pots that are only slightly cracked, they are often kept and repaired with wax (brea).

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286 since such weaving is done in large measure only at odd times.

The trunks or mocho (pl. CXVI) worn by the men is [294] made of cloth woven by the women, a special narrow fabric being produced for this purpose. One of these pieces of cloth contains enough for two mochos. It is always cut and sewed by the men themselves, some of [462] them being adept with the needle. The women know almost nothing about sewing. It ordinarily even falls to the men to make the small mochos for the boys until they are old enough to sew for themselves.

The subject of manta designs is treated under Decorative Art.

CORDAGE AND NETTING

283 [824] In most cases cordage and nets are made of the fine, long, white fibers obtained from the leaf of the plant called in Spanish pita and in Cayapa sa'nō, and to a much more limited extent the fibers from the bark of a tree called in Spanish cosadera and in Cayapa señgi'lya are used.

The preparation and manipulation of pita, to which reference has been made hitherto, are quite elaborate. The long, slender, full-grown leaves of the plant are cut off close to the ground and brought to the house in bundles, such as those shown leaning against the house in pl. LXVI. While the leaf is still green the fibers are extracted by first scraping off the succulent portion of the concave side of the leaf and then stripping out the fibers 283 from the remainder. For this scraping there are required • 413 a semi-cylindrical log of palm-wood, called sañwi ci'nō,

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and a double-edged shaving knife, called saiwi'cuipapa. The log is half of a nine or ten foot section of a trunk of the pambil palm. Its flat side is leaned against one of the horizontal beams that compose part of the superstructure of the house, at an angle of about twenty degrees with the perpendicular and about midway between two vertical poles the tops of which are bound to the opposite or outer surface of the beam. These poles, which are usually the forked ones used to support the loom, are placed about two feet and a half apart. At a height of six or seven feet from the floor a piece of pitigua is bound to the two poles and so placed that it passes horizontally across the curved surface of the log. A second piece of pitigua is tied horizontally and at a level also about six or seven feet from the floor, but at a distance of several feet toward the interior of the house.

The pita leaves are now sorted according to length. Six or eight leaves are then piled neatly one upon another, bottom uppermost. This bunch is bent double and passed behind the pitigua cord that runs directly across the log; the cord presses the leaves at their fold tightly against the log, holding them in place during their manipulation. The leaves are always placed so that the concave side of each is uppermost and so that at first the bases of the leaves hang down against the log. The upper half of the bunch of leaves, and also those individual leaves of the lower half which are not actually in use, are kept out of the way by being passed up over the cord above mentioned, which is stretched at some distance from the log.

Beginning now with the base ends of the leaves, the

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263 lowest one in the bunch is brought down on the convex surface of the log, and with the corner of a knife the succulent outer layer is split throughout the length of the section of the leaf exposed. This allows the leaf to be easily flattened against the log so that the succulent layer may be scraped off with one of the edges of the knife (fig. 25).

263 493 [824] The knife used for this purpose is illustrated in pl. CXVIII, 2. It is usually made from half of a section of wild cane (Spanish caña brava), and is ordinarily from fifteen to eighteen inches in length. The soft center of the cane is hollowed out so that only the hard, woody portion of the outside of the stalk remains. The two edges of this semi-cylindrical section are very sharp, thus producing a serviceable implement.

263 The succulent portion of the leaf having been scraped off and the fine fibers exposed to a length of eight or ten inches at the base of the leaf, the fibers are loosened with a thumb or finger nail and are then split loose as far up the leaf as the scraping has progressed by pulling them gently outward. A slit is then made in this scraped section and the loosened fibers are passed through and looped (fig. 25) in such manner as to prevent them from becoming tangled as the scraping proceeds farther up the leaf. When this half of the leaf is completely scraped, it is hung at the side of the pole and the corresponding portion of the next leaf is scraped.

Finally, all the lower halves of the leaves having been scraped, the upper halves which had been placed overhead are brought down upon the log and held in position by means of the horizontal cord which secured the lower

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in length and is used as a distinct unit in the weaving. When the weaving has proceeded to within six or eight inches of the end of the cord, a second is simply tied to it in a square knot and thus is added a new unit of material. Hence no shuttle is required as among peoples who use a very long thread or cord. In fact the only implement required in weaving is the mesh-stick, which is usually of bamboo, although large ones are sometimes made of wood. It is ordinarily from five to seven inches in length and varies in width according to the size of mesh desired (fig. 26). The relatively wide ones used in weaving the large-meshed set-net are called wa'lō tcīpapa, thus differentiating this form from that known as afa'ia tcīpapa, or ate' tciyapa, used in weaving the casting net. The general term for mesh-stick is ya' tcīpapa.

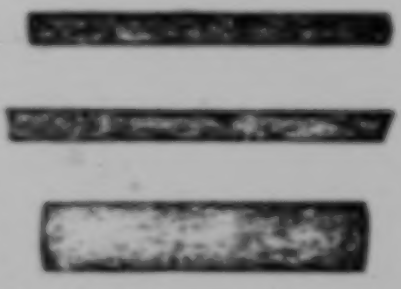

FIG. 26.—Mesh-sticks or gauges for weaving nets

In weaving one of the large set-nets, such as that shown in pl. CXX, 2, and called by the Cayapa wa'kū, the required number of knots, usually five, is first tied to start the corner of one end. By adding a knot at each end, new meshes are added; and as each row of meshes is woven, the width of the net may be increased to any desired degree. This first portion of the net forms a right triangle, one side of which represents the width of the net, the other an equal length along one side of the net. The hypotenuse of the triangle is the line along